PUBLIC DISCLOSURE

BEFORE THE
GEORGIA PUBLIC SERVICE COMMISSION

In Re:

GEORGIA POWER COMPANY'S	**)**	**DOCKET NO. 44280**
2022 RATE CASE	**)**	

DIRECT TESTIMONY AND EXHIBITS

OF

STEPHEN J. BARON

LEAH WELLBORN

ON BEHALF OF THE

GEORGIA PUBLIC SERVICE COMMISSION
PUBLIC INTEREST ADVOCACY STAFF

OCTOBER 20, 2022

TABLE OF CONTENTS

I. BACKGROUND AND QUALIFICATIONS 3

II. SUMMARY AND RECOMMENDATIONS 4

III. REVIEW OF REVENUE FORECAST METHODOLOGY 9

ENERGY FORECAST 9

REVENUE FORECAST 10

FORECAST RECONCILIATION 12

HISTORIC REVENUES AND TREND REVIEW 16

FORECAST COMPONENT REVIEW 16

RESIDENTIAL 19

COMMERCIAL 20

INDUSTRIAL 21

RTP 22

LIGHTING 23

MARTA 25

AVERAGE RATE CURVE AND STATISTICAL ANALYSES 25

IV. RECOMMENDED REVENUE FORECAST DOCUMENTATION 29

I. BACKGROUND AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAMES, TITLES, AND BUSINESS ADDRESSES.

A. My name is Stephen J. Baron. I am President and a Principal of Kennedy and Associates. My business address is 570 Colonial Park Drive, Suite 305, Roswell, Georgia, 30075.

My name is Leah J. Wellborn. I am Manager of Consulting at Kennedy and Associates. My business address is 570 Colonial Park Drive, Suite 305, Roswell, Georgia, 30075.

Q. WHAT CONSULTING SERVICES DOES KENNEDY AND ASSOCIATES PROVIDE?

A. Kennedy and Associates provides consulting services related to electric utility system planning, resource analysis, production cost modeling, ratemaking, finance, accounting, and industry policy issues.

Q. PLEASE PROVIDE SUMMARIES OF YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. Summaries of our education, experience, professional certifications, and testimony appearances are provided in Exhibits STF-BW-1 and STF-BW-2 for Mr. Mr. Baron and Ms. Wellborn, respectively.

Q. HAVE YOU BOTH PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. Mr. Baron and Ms. Wellborn have testified before this Commission on a number of occasions. Most recently, Mr. Baron and Ms. Wellborn testified in the Georgia Power Company's 2022 Integrated Resource Plan proceeding (Docket No. 44160).

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. We are presenting testimony on behalf of the Commission's Public Interest Advocacy Staff ("Staff").

II. SUMMARY AND RECOMMENDATIONS

Q. WHAT ARE THE SPECIFIC ISSUES THAT YOU ADDRESS IN YOUR TESTIMONY?

A. The issues we address are associated with Georgia Power's projected retail revenues, at present rates, for the test year in this case (12 months ending July 31, 2023) and each of the three Plan Years: 2023, 2024 and 2025. For each of these four periods, the Company has developed a detailed revenue forecast that estimates the revenues that the Company will receive at present Commission approved rates. In order to develop the revenue deficiency in this case, projected revenues at present rates are compared to the revenue requirement for each of the four periods. The difference between these two amounts

(revenues at present rates and revenue requirements) produces the amount of the revenue deficiency and rate increase that is necessary to recover the revenue requirement.

The purpose of this testimony is to present our findings and recommend appropriate adjustments to the Company's revenue projections based on the Staff's independent development of alternative revenue forecasts for a number of rate classes.

Q. PLEASE DESCRIBE THE ANALYSES THAT THE STAFF PERFORMED TO ASSESS THE REASONABLENESS OF THE COMPANY'S REVENUE FORECASTS FOR THE TEST YEAR AND THREE PLAN YEARS.

A. The Staff reviewed and analyzed approximately 50 Excel spreadsheets/models developed by the Company that ultimately rolled-up into the retail revenue forecasts shown in Exhibit APA-SPA-ADH-MBR-1, Schedule 1 Total Company ("Schedule 1") for the test year and each Plan Year. Schedule 1 provides the revenues used by the Company to determine the revenue deficiency in this case, both on a traditional basis and on a levelized basis.

The initial starting point for the development of the revenue forecast is the projection of base tariff revenues for each of the Company's five rate classes (Residential, Commercial, Industrial, Governmental Lighting, MARTA). These base tariff revenues are the revenues produced from the Company's individual rate schedules. In addition, there are revenues produced by various riders ("Recovery Tariffs"), fuel charges, and a number of adjustments

that will be discussed subsequently in our testimony. Table 1 below shows the components that comprise the Total Company retail revenues included in Schedule 1 for the test year, based on the original filing. Also included are the adjustments made by the Company to Schedule 1 in the Supplemental Filing.

Table 1: GPC Test Year Projected Revenues ($000)

Present Revenue by Rate (MFR F-4)	**6,091,456**
NCCR, MFF Adjustments	8,155
Retail Revenue Forecast (Appendix Exhibit 1_2)	**6,099,611**
Retail Fuel Revenues, adjustments	2,004,392
Total Sales of Electricity (AAHR Schedule 1 Original Filing)	**8,104,003**
Supplement Filing Adjustments	(3,756)
Total Sales of Electricity (AAHR Schedule 1 Supplemental)	**8,100,247**

Table 2 summarizes the information for the test year and each Plan Year.

Redacted Table 2: GPC Projected Revenues ($000) – Test Year and Plan Years

	Test Year	2023	2024	2025
Tariff Revenue Projected (JKA 1-2 Attach R Update)				
Recovery Tariff Revenues, adjustments				
Retail Revenue Forecast (Appendix Exhibit 1_2)				
Retail Fuel Revenues, adjustments				
Total Sales of Electricity (AAHR Schedule 1 Original Filing)				
Supplement Filing Adjustments				
Total Sales of Electricity (AAHR Schedule 1 Supplemental)				

As shown in Tables 1 and 2, the revenues produced by base tariffs (rate schedules) form the largest portion of total retail revenues. All of these revenue projections are based on an assumption that current base tariff rates charges remain in effect in the test year and Plan Years without any rate change. What does change, however, are rate class kWh sales,

the number of customers in each rate class and the impact of these changes on the average rate produced by existing rate designs.[1] The Staff's primary analysis focused on these base tariff revenue projections. For the largest rate classes the Company relied on statistical regression models to develop average rate curves. These average rate curves, when combined with the Company's projected MWh sales forecasts developed in the recent IRP case produce projected base tariff revenues for each rate class and sub-class. In its analysis, the Staff analyzed alternative specifications and estimation periods in cases where the staff believed that an alternative model would be more appropriate. Based on this analysis, the staff developed three alternative average rate curve models.

Q. WHAT ARE THE STAFF'S RECOMMENDED ADJUSTMENTS TO THE COMPANY'S TEST YEAR AND PLAN YEAR RETAIL REVENUES?

A. Table 3 summarizes the Staff's recommended adjustments to projected test year and Plan Year retail revenues.

[1] For example, if the average kWh usage per customer for the residential class changes, even though the tariff rates do not change, the average revenue produced by each residential kWh will change. Measuring this change is the basis of the revenue forecast.

Table 3: Staff Projected Revenues Per Schedule 1 - Test Year and Plan Years ($000)

	Test Year	CY 2023	CY 2024	CY 2025
Original Filing:				
GPC	8,104,003	7,994,109	7,928,981	8,002,496
Staff	8,110,042	7,999,854	7,933,895	8,010,328
Staff Adjustment	6,039	5,745	4,914	7,831
Supplemental Filing:				
GPC	8,100,247	7,987,736	7,915,934	7,983,007
Staff	8,106,282	7,993,475	7,920,837	7,990,816
Staff Adjustment	6,035	5,739	4,903	7,808

Table 3 shows the Staff's recommended adjustments based on both the Company's original filing and its Supplemental Filing. The Staff's analysis indicates that retail revenues, based on current rates (i.e., no rate change) would be about $6 to $8 million higher than estimated by the Company. As we will discuss subsequently, the Staff's adjustments are based on the results using alternative statistical models that project average rates/kWh for four of the Company's retail rate classes and sub-classes. These model differences, when projected on a monthly basis for the period August 2022 through December 2025 produce a relatively small change in projected revenues.[2] For example, in the test year ending July 2023, the total retail revenues projected by the Company in its Supplemental filing are shown to be $8,100,247 ($000)[3] (see page 4 of Schedule 1). The Staff's analysis produces a retail revenue amount that is about 0.1% greater [$8,106,282 ($000)].

[2] The Staff's recommended revenues also include the related impacts of the alternative base tariff revenue forecasts on Recovery Tariff revenues and other adjustments.
[3] See page 4 of Company Schedule 1 Supplemental.

Q. IS THE STAFF RECOMMENDING THAT THE COMMISSION ADOPT ITS ALTERNATIVE REVENUE PROJECTIONS?

A. Yes. The Staff has incorporated its adjusted revenue projections in the overall recommended revenue deficiency in this case. Staff believes that its alternative average rate curve models are more reasonable than the Company's estimates, and therefore supports its retail revenue adjustments based on those alternative models. As we will explain in later in this testimony, the use of a projected test year or projected plan years requires numerous forecasts of revenues, expenses, investment, and other factors. For the most part, the Staff agrees with the Company's methodology used to project revenues. The Staff's alternative average rate curve statistical models, which rely on the same historic information as used by the Company in its analyses, are simply alternative statistical model specifications, which the Staff believes are more reasonable than the models developed by the Company.

III. REVIEW OF REVENUE FORECAST METHODOLOGY

ENERGY FORECAST

Q. WHAT WAS THE STARTING POINT FOR DEVELOPING THE REVENUE FORECASTS FOR EACH OF THE FOUR PERIODS?

A. Each of the four revenue forecasts (test year and three Plan Years) were developed using the identical methodology. Separate forecasts were developed for each of the five rate classes (residential, commercial, industrial, governmental lighting and MARTA). The forecasts are driven by the kWh energy sales forecasts presented by the Company in the 2022 IRP case and is designated as the B22 Forecast. This rate class energy forecast was previously evaluated by the Staff in the IRP case. The Staff did not recommend any adjustments to the energy sales forecast in the IRP case and the Company's B22 sale forecast was approved by the Commission in its Order in that case. The Company did not make any adjustments to the approved B22 sales forecast in its revenue forecast in this case.[4]

REVENUE FORECAST

Q. HOW DID THE COMPANY DEVELOP ITS REVENUE FORECAST?

A. For the residential and parts of the commercial and industrial rate classes not associated with a real-time pricing ("RTP") rate,[5] the revenue forecast is based on the product of the B22 energy forecast each month and a projection of the average rate/kWh for the class (e.g., residential) or subclass within a class (e.g., commercial FPA, commercial Non-RTPFPA, commercial RTP CBL, industrial FPA, industrial RTP CBL, where "FPA" stands for fixed pricing alternative). For the residential class and five commercial and

[4] Response to STF-JKA 1-3.
[5] Real-Time Pricing rates are retail tariffs available to customers that price energy at marginal prices. Generally, the energy sold at an RTP price is indicative of a market price with a risk adder.

industrial subclasses, the Company developed statistical regression models to forecast the average rate/kWh as a function of monthly average kWh usage per customer for the class or subclass. For commercial and industrial RTP subclasses, and lighting and MARTA revenues, revenues were projected using a number of different methodologies, which will be discussed later in our testimony. The methodology that the Company employed is much more complex than what was presented in its minimum filing requirements.[6]

In addition to the development of base tariff revenue forecasts described above, the Company also developed separate projections of rider revenues associated with Nuclear Construction Cost Recovery (NCCR), Demand Side Management (DSM), Environmental Compliance Cost Recovery (ECCR), and Municipal Franchise Fee (MFF) tariffs.

Q. PLEASE EXPLAIN HOW THE REVENUE FORECAST CHANGES BY CLASS OVER THE FORECAST YEARS.

A. The Company provided estimates of forecasted retail revenues for the test year in this case (12 months ending July 31, 2023) and for three Plan Years (calendar years 2023, 2024 and 2025). For the test year, the retail revenue forecast projects that the Company will receive $6,099,611 ($000) at present rates, excluding fuel adjustment charges. Table 4 provides a breakdown of the Company's overall forecast into 5 rate classes (Residential, Commercial,

[6] Appendix Exhibit 1_2.

Industrial, Government Lighting ("GL", "Light"), and MARTA. All of the Company's revenue projections are based on these 5 rate classes. These revenue forecasts are then allocated to individual rate schedules within each rate class. These amounts estimate the projected revenues for the test year without a rate case and rate increase. It is from this estimate that the rate increase is measured (the amount of the dollar increase).

Table 4: GPC Projected Test Year Base and Rider Revenues ($000)

GPC	Residential	Commercial	Industrial	Light	MARTA	**TOTAL**
Base	2,330,124	1,766,773	690,672	55,862	4,191	**4,847,622**
ECCR	421,515	306,705	92,714	10,344	609	**831,887**
NCCR	91,690	67,746	20,270	2,253	133	**182,092**
DSM	22,883	22,180		748		**45,811**
MFF	86,729	71,193	32,166	1,842	269	**192,199**
TOTAL	**$2,952,941**	**$2,234,598**	**$835,821**	**$71,050**	**$5,201**	**6,099,611**

It should be noted that this total revenue amount does not include fuel revenues or a number of adjustments to tie to Schedule 1 revenues. These will be discussed later in our testimony.

FORECAST RECONCILIATION

Q. THE COMPANY PROVIDED REVENUE FORECASTS ACROSS A NUMBER OF ITS FILED DOCUMENTS. WERE THESE DOCUMENTS CONSISTENT?

A. No.

Q. THE COMPANY'S SCHEDULE MFR F-4 SHOWS THAT BASE AND RIDER (RECOVERY TARIFF) REVENUES, EXCLUDING FUEL, FOR THE TEST YEAR ARE $6,091,456,316. THIS IS ALSO THE BASIS FOR THE COMPANY'S TEST YEAR RATE DESIGN. WHAT IS THE DIFFERENCE BETWEEN THE REVENUES SHOWN IN MFR F-4 AND THE $6,099,611,080 SHOWN IN TABLE 4?

A. The difference ($8,154,764) represents two adjustments that the Company made to projected test year revenues. The first adjustment increases revenues by $[redacted] to reflect higher NCCR revenues in the revenue forecast than what was used for rate design; the second adjustment is a reduction in test year MFF revenues of $[redacted].

Q. WHAT IS THE TOTAL REVENUE BY RATE CLASS PROJECTED BY THE COMPANY FOR THE TEST YEAR AND EACH OF THE THREE PLAN YEARS?

A. Table 5 shows the total test year and Plan Year revenue amounts based on the Original Filing and the adjustments made in the Supplemental Filing. Total revenue includes the amounts shown in MFR-4, plus a number of additional items that are included in the calculation of the Company's filed revenue deficiency. Table 5 provides the full reconciliation of the base tariff revenues, Recovery tariff revenues, fuel revenues and each of the adjustments made by the Company to produce the Retail Revenue amounts shown in Schedule 1 in both the Original Filing and the Supplemental Filing.

The first section of Table 5 shows the results of the Company's revenue forecast modeling, including both the average rate curve modeling and the forecasts using other methods (e.g., trend analysis). The second section shows Recovery Tariff revenues and various adjustments that are needed to properly reflect revenues at present rates in the projected periods. One of the large adjustments ($194 million) is needed to reflect the additional revenues produced by the 2019 rate case 3rd step revenue increase that occurred on January 1, 2022. Because all of the Company's revenue forecast modeling only reflected data through August 2021, the January 2022 revenue increase was not included in the model-based forecasts. As such, the Company added an additional $194 million as an after-the-fact adjustment.

The third section of Table 5 removes both the NCCR revenues and the MFF revenues from the forecast, as well as adds in fuel revenues. In addition, a small amount of wholesale revenues are included as a revenue credit in the projection.

Redacted Table 5: GPC Projected Base and Recovery Tariff Revenues ($000)
Test Year and Plan Year Reconciliation with Schedule 1

Base Tariff Revenues (per the revenue forecast modeling)	Test Year	2023	2024	2025
Residential				
Commercial				
Industrial				
Street Light				
Marta				
Tariff Revenue Projected (JKA 1-2 Attach R Update)				
Flat Bill Adjustment				
2019 Rate Case 3rd Step Revenue Increase				
ECCR				
DSM				
NCCR				
MFF				
Incremental (RTP Rev)				
Retail Revenue Forecast (Appendix Exhibit 1_2)				
NCCR Tariff Adjustment (remove NCCR revenues)				
DSM Tariff				
Municipal Franchise Fees Adjustment (remove MFF revenues)				
Normalizaton Items				
NCCR/DSM (Over/Under) Recovery				
Total Retail Fuel Revenues				
Wholesale Revenues				
Total Sales of Electricity (AAHR Schedule 1 Original Filing)				
Traditional Base				
ECCR				
DSM				
Wholesale				
Total Sales of Electricity (AAHR Schedule 1 Supplemental)				

Q. DID THE COMPANY PROVIDE THIS COMPLETE RECONCILIATION IN ITS TESTIMONY, EXHIBITS OR WORKPAPERS THAT IT FILED IN THIS CASE?

A. No. Through a number of formal and informal data requests, the Company has provided information that permitted the development of a complete reconciliation. As will be discussed later in our testimony, the Staff strongly recommends that in future rate cases, the Company be required to file complete reconciliations so that the Staff and other parties

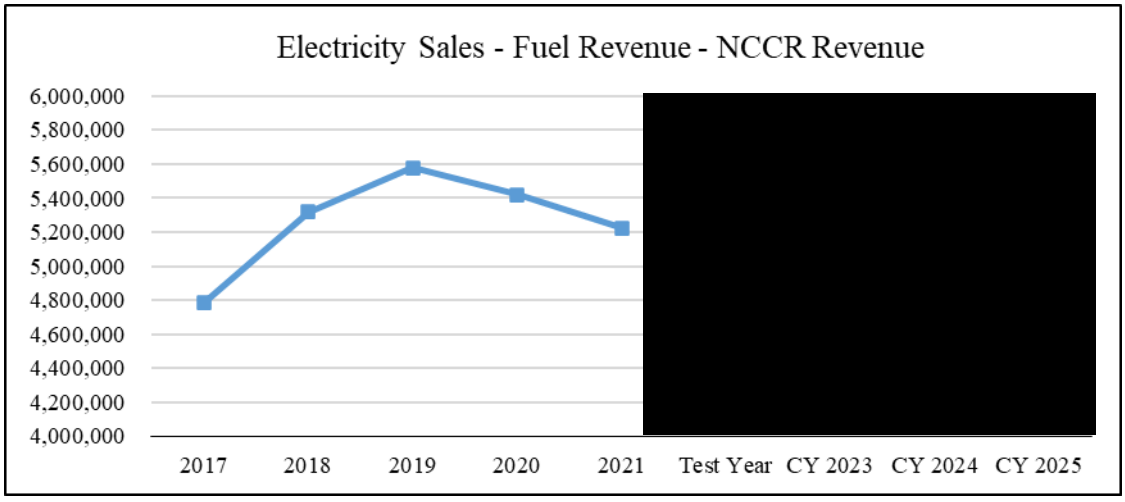
can evaluate the entirety of the Company's analysis. This should also include detailed explanations of the items included in the reconciliation.

HISTORIC REVENUES AND TREND REVIEW

Q. HOW DOES THE COMPANY'S FORECAST COMPARE TO HISTORICAL TRENDS?

A. Figure 1 provides a high-level comparison of the trends.[7] Staff believes the forecast is generally consistent with the historical trend. It is important to recognize that the historical data included base rate increases, while the projected data is based on current rates as of January 2022.

Redacted Figure 1: Comparison of Forecasted Revenues to Recent History ($000)



[7] Historic sales Revenue data is from GDS 3-1 from Docket 44160 (Public Disclosure) adjusted for Fuel Cost (PD) and NCCR cash collections (Docket 29849, STF-230-26-b, Public Disclosure). Forecasted data is from JKA 1-2 Attachment R Update 2022-25 TRADESECRET "RECONCILE FOR STAFF" tab.

FORECAST COMPONENT REVIEW

Q. YOU NOTED PREVIOUSLY THAT THE STAFF FOCUSED ITS ANALYSES ON THE BASE TARIFF PROJECTIONS THAT RELIED ON STATISTICAL AVERAGE RATE CURVE MODELING. WOULD YOU DISCUSS THE COMPANY'S AVERAGE RATE CURVE MODELING?

A. The Company derived its average rate curve models utilizing the EViews statistical software. Each statistical regression model followed the same general specification; average cost per kWh for the rate class or, in the case of the commercial and industrial classes, by sub-class was the dependent variable and the independent variables consisted of various formulations of average kWh usage per customer and indicator variables (binary variables). To produce the monthly revenue forecast, the projected average rate per kWh is multiplied by the kWh energy sales forecast for the rate class (or sub-class) using the B22 energy forecast presented in the recent IRP case.

For certain classes (commercial incremental RTP, industrial incremental RTP, industrial NonRTPFPA, Government Lighting, MARTA), the revenue forecasts are derived using more direct approaches. The forecasts are made up of numerous subparts that are summed together to derive the class forecast. The subparts, or components, have specific short-hand, and generally include an average rate curve component, an "FPA" component which describes the Fixed Pricing Alternative rate design, or a Real Time Pricing ("RTP") incremental rate and an RTP Customer Baseline Load (CBL) component. The total forecast

can be distilled down into approximately 12 individual forecast components, as summarized in Table 6.[8] The Company's forecasting approach breaks the commercial, industrial and MARTA rate classes into these separate groups (components) that reflect similar rate designs. For example, customers taking service under the Commercial RTP rates pay separate charges for their CBL usage and their incremental usage. Since the underlying rates for these two components (CBL, incremental usage) are priced differently, it is reasonable to separately develop revenue forecasts for each component. These are then combined to develop the total Commercial RTP revenue projection. The table describes the components of each forecasted revenue class as well as a note on Staff's review and any proposed adjustment.

[8] In the 2022 rate case, the Company did not include commercial or industrial adjustments in its base tariff forecasts.

Table 6: Revenue Forecast Components Reviewed

Forecasted Class	Forecast Component	Staff Adjustment Summary
Residential	Residential	**Rate Curve (Staff Adjustment)**
Commercial	Com FPA	Rate Curve
	Com NonRTPFPA	**Rate Curve (Staff Adjustment)**
	Com CBL - RTP	Rate Curve
	Com Adj	N/A
	Com Incr - RTP	RTP Workpaper
Industrial	Ind FPA	Rate Curve
	Ind NonRTPFPA	Trend Analysis[1]
	Ind CBL - RTP	**Rate Curve (Staff Adjustment)**
	Ind Adj	N/A
	Ind Incr - RTP	RTP Workpaper
Govt Lighting	Govt Lighting	Govt Lighting Trend Analysis[2]
MARTA	Marta CBL -RTP	Marta Direct Computation[3]
	Marta INCR - RTP	RTP Workpaper

[1] JKA 1-2 Attach G
[2] JKA 1-2 Attach M
[3] JKA 1-2 Attach N

RESIDENTIAL

Q. HOW DID THE COMPANY ESTIMATE THE RESIDENTIAL CLASS BASE TARIFF REVENUES?

A. The Company modeled the residential class in total (i.e., no residential sub-class/rate schedule individual modeling) and derived an average rate curve to estimate revenues. As described above, Staff estimated an alternative residential average rate curve model. Based on this alternative model, the Staff determined that the residential class revenues should be increased for the four revenue forecast periods. The Staff's evaluation of the average rate curve models is discussed subsequently in our testimony.

COMMERCIAL

Q. HOW DID THE COMPANY ESTIMATE COMMERCIAL CLASS REVENUES?

A. The Company developed its commercial class revenue forecast based on three commercial sub-classes: FPA, NonRTPFPA and CBL RTP. The FPA sub-class includes legacy customers who were on the rate beginning in 2011 and customers who have been on an RTP rate for three consecutive years.[9] The RTP revenue forecast is comprised of an RTP incremental component and a CBL component. The CBL component is priced based on a standard tariff. The "Com Incr RTP" component represents the non-fuel portion of the commercial class RTP rate (the fuel portion is included in overall retail fuel revenues). This incremental non-fuel RTP revenue forecast is developed using spreadsheet analysis. These revenues include both non-fuel RTP revenue produced by day ahead and hour ahead tariffs.

For the commercial FPA, non-RTPFPA and CBL forecasts, the Company developed average rate curve models as it did for the residential class. The Staff's evaluation determined that an alternative average rate curve model would be appropriate for the non-RTPFPA average rate curve model, which resulted in an adjustment to forecasted revenues. The Staff's evaluation of the average rate curve models is discussed subsequently in our testimony.

[9] GPC Schedule FPA-11, Fixed Pricing Alternative.

INDUSTRIAL

Q. HOW WERE THE INDUSTRIAL REVENUES DERIVED?

A. Industrial Class Revenues were forecasted based on modeling of five components:

- **Ind FPA:** Industrial Fixed Pricing Alternative for eligible legacy customers and former RTP customers (average rate curve methodology)
- **Ind NonRTPFPA:** Industrial Fixed Pricing Alternative for non-RTP revenues (trend analysis of average rate per kWh)
- **Ind CBL:** Industrial Customer Baseline Load (average rate curve methodology)
- **Ind Adj:** Industrial Adjustment (No adjustments in this forecast, zero value)
- **Ind Incr:** Industrial Incremental prices (RTP)

As shown in Table 6, only two of the five Industrial sub-class forecasts are based on average rate curve modeling: the Ind FPA forecast and the Ind CBL forecasts. For the Ind. NonFPARTP sub-class, revenues were projected based on a trend analysis of the average rate per kWh.[10] The Company's trend forecast is based on a moving average using monthly data spanning Jan 2015 to Aug 2021 and repeats, by month, exactly for each forecast year.

[10] STF JKA-1-2 Attachment G.

As in the commercial class, the "Ind Incr" component represents the non-fuel portion of the industrial class RTP rate (the fuel portion is included in overall retail fuel revenues). This incremental non-fuel RTP revenue forecast is developed using spreadsheet analysis. This revenue includes both non-fuel RTP revenue produced by day ahead and hour ahead tariffs.

The Staff's evaluation determined that an alternative average rate curve model would be appropriate for the industrial CBL sub-class, which resulted in adjustments to forecasted revenues. The Staff's evaluation of the average rate curve models is discussed subsequently in our testimony.

RTP

Q. HOW DID THE COMPANY DEVELOP ITS FORECASTS OF COMMERCIAL AND INDUSTRIAL INCREMENTAL RTP REVENUE?

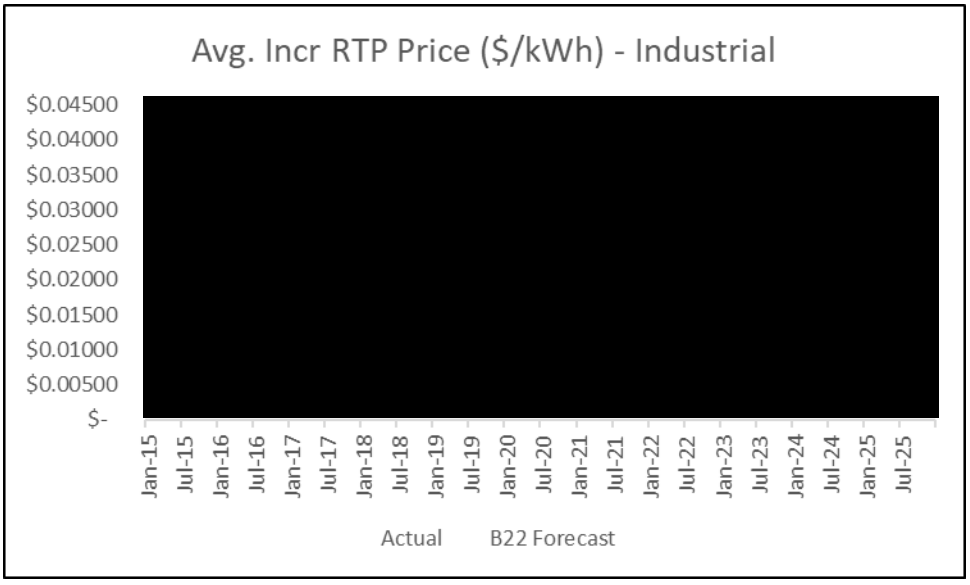
A. Staff in its requests for all workpapers supporting the revenue forecast was finally provided, in an informal response, the derivation of the RTP component forecasts on August 26, 2022. In the Company's informal response, the derivation utilized a monthly day ahead and hour ahead price together with the monthly MWh estimated for both day ahead and hour ahead schedules despite describing an hourly methodology. The Company

further explained in follow up data responses, that the derivation of the monthly values was derived from hourly values.[11]

Q. HOW DO PROJECTED RTP RATES COMPARE TO HISTORIC RTP RATES?

A. The following graph (Figure 2) shows the historic RTP price, [redacted] by month trending into the forecasted.[12]

Redacted Figure 2: RTP Price (excludes RTP fuel cost)



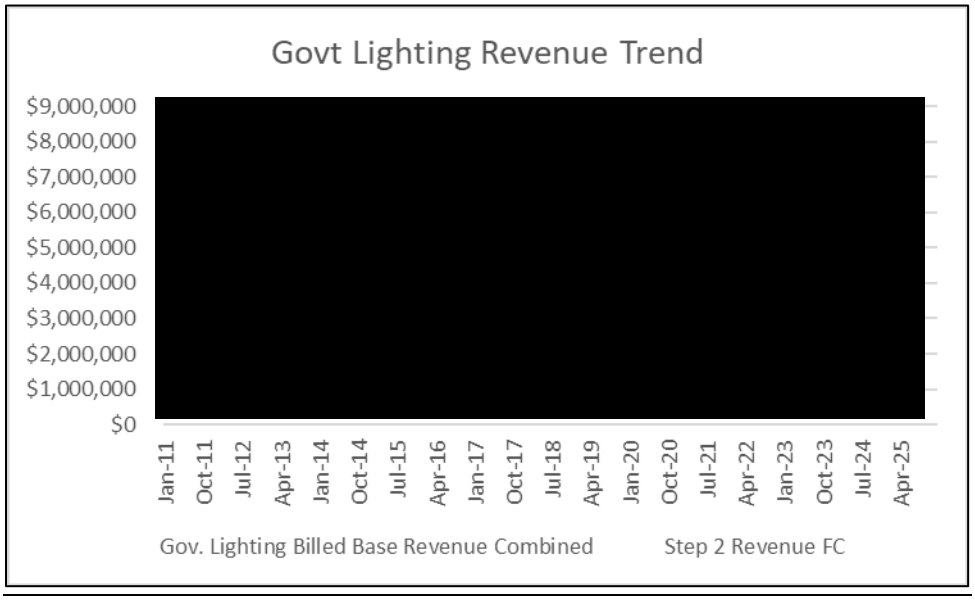
LIGHTING

[11] JKA 5-1 and 5-2 describe the methodology and JKA 5-7 the underlying data supporting the monthly figures with hourly data.
[12] Data from: STF-JKA-1-2 Attachment G TRADE SECRET.xlsx.

Q. WHAT IS YOUR ASSESSMENT OF THE COMPANY'S GOVERNMENT LIGHTING FORECAST?

A. The Company describes its modeling as a trend analysis which mainly accounts for the gradual replacement of older lighting with newer more efficient infrastructure.[13] Staff reviewed the trend of historic data used to produce the forecasted revenues and it does appear flat, which would be consistent with any increased load being offset by increasingly efficient fixtures.

Redacted Figure 3: Government Lighting Revenues



[redacted]

[redacted]

[13] STF-JKA-1-2 Attachment M TRADE SECRET.xlsx contains the data and STF-JKA-1-2 Attachment L.docx the narrative description.

[redacted]

[redacted]

MARTA

Q. WHAT IS YOUR ASSESSMENT OF THE COMPANY'S MARTA FORECAST?

A. The Company models the MARTA revenues following the MARTA tariff rate structure with blocked energy pricing. The Company's estimate was based on 2021 rates, and then adjusted up with a Year 3 adjustment to get the 2022 base rates as baseline for the projection in 2022-2025.[14]

AVERAGE RATE CURVE AND STATISTICAL ANALYSES

Q. WOULD YOU DISCUSS THE COMPANY'S AVERAGE RATE CURVE STATISTICAL MODELING?

A. As shown in Table 6, the Company develops statistical regression models to forecast the average rate per kWh for six rate classes and sub-classes. These models are all based on a general relationship between a rate schedule's average rate per kWh and the average kWh usage per customer for the rate. The estimated regression models are then used to forecast the average rate per kWh for the class using the Company's B22 energy forecast (kWh per

[14] MARTA revenue forecast provided in STF-JKA-1-2 Attachment N TRADE SECRET.xlsx.

customer) that was presented in the 2022 IRP case. The product of the forecasted average rate per kWh and the B22 forecasted kWh sales for the rate class or sub-class produces the base tariff revenue forecast. The focus of the Staff's review and analyses was on the various average rate curve statistical regression models. The kWh energy sales forecast ("B22") was already addressed by the Staff in the IRP case.

Q. HOW DID THE COMPANY DEVELOP ITS MODELS?

A. Georgia Power Company uses a statistical analysis software package called "EViews" to develop its average rate curve models. The Staff obtained EViews and was able to fully evaluate each of the Company's models.

Q. WHAT WERE THE RESULTS OF THE STAFF'S EVALUATION OF THE COMPANY'S AVERAGE RATE CURVE MODELS?

A. The Staff found that for three of the Company's models, an alternative specification produced more reasonable statistical results. The Company's models used monthly binary variables for most months that were formed by taking the product of the average kWh usage in the month and a "1" if the observation was for the same month and a "0" if the month was different. For example, if the observation was for January, the January binary variable would be equal to the average kWh use in the month times "1." If the observation was for February, the January binary variable would be equal to "0" (average kWh use in

February times "0" equals "0"). The effect of this modeling specification is that, in general, each month has its own estimated coefficient that relates average usage and the average rate per kWh. While the Staff does not have concerns with this approach, it is somewhat similar to estimating separate average rate curve models for each month. The Staff's alternative models are based on modified specifications and estimation periods that the Staff believes are more appropriate. Staff is recommending alternative rate curves that incorporate a number of adjustments. The adjustments made by the Staff for each of the models are as follows:



Q. HOW DO THE STATISTICAL RESULTS PRODUCED BY THE STAFF'S ALTERNATIVE MODELS COMPARE TO THE COMPANY'S MODELS?

A. Staff's proposed alternate models perform about the same as the Company's models, but one of the Staff models has a slightly lower R^2 (the "Commercial NonRTPFPA" model).[15] The Staff believes that its revised models are less likely to overfit the data than the

[15] R-squared (R^2) is the Coefficient of Determination in a regression model. R^2 is a measure of how well the model (independent variables) explain the variation in the dependent variable. Specifically, it measures the percentage of the variation in the dependent variable (average rate/kWh) that is explained by the model (average kWh usage per customer, binary variables).

Company's models.[16] Also, the Staff's models tend to have a better pattern of residuals that the Staff believes support the use of the model adjustments.[17]

Q. WHAT IS THE IMPACT OF USING THE STAFF'S ALTERNATIVE AVERAGE RATE CURVE MODELS ON THE REVENUE FORECAST FOR THE TEST YEAR AND THE THREE PLAN YEARS?

A. Using the Staff's alternative average rate curve models produces an additional $6 million to $8 million of revenue at current rates for the four periods.

Q. DOES THE STAFF BELIEVE THAT THE COMPANY'S AVERAGE RATE CURVE MODELS AND THE RELATED REVENUE FORECASTS ARE UNREASONABLE?

A. No. As noted earlier in our testimony, the Staff did not identify any specific errors or significant problems with the Company's analyses. Rather, the Staff believes that its alternative models provide a more reasonable measure of projected test year and Plan Year revenues.

[16] A model that overfits the sample data results in independent variables that appear to be significant in explaining the dependent variable, but in fact are just explaining the residuals. This can lead to incorrect conclusions in the analysis and unreliable forecasts.

[17] A requirement of a linear regression model is that the residuals (the difference between the model predicted value and the actual value) follows a normal probability distribution. To the extent that an estimated model produces residuals that are not normally distributed (i.e., deviate from the normality assumption), tests of significance of the estimated coefficients may not be reliable.

IV. RECOMMENDED REVENUE FORECAST DOCUMENTATION

Q. DOES STAFF HAVE ANY RECOMMENDATIONS TO ESTABLISH A REQUIREMENT FOR FILING DETAILED REVENUE FORECAST TESTIMONY AND WORKPAPERS IN FUTURE RATE CASES?

A. Yes. Notwithstanding the Staff's recommended test year and Plan Year revenue forecast adjustments, the Staff did not find specific problems with the Company's overall revenue forecast process in this case. However, in order to make this assessment, the Staff was required to issue multiple data requests for Excel workbooks, narrative explanations, and follow-on data requests in order to fully evaluate and understand the basis for the Company's test year and three Plan Year projections. The Company did not present any testimony on this important issue, nor did the Company file any supporting workpapers with its filing that would facilitate and independent evaluation by the Staff. In the end, following the Staff's formal and informal data requests, the Company provide numerous Excel workbooks containing about 50 individual Excel models that provide the support for its revenue forecasts. The Company also provide a number of narrative descriptions supporting the development of the retail revenue projections for the four test periods (Test Year and Plan Years 2023, 2024 and 2025).

In future Georgia Power Company base rate cases, the Company should be required to file a complete set of workpapers, consistent with all of the Excel workbooks and spreadsheets ultimately provided to the Staff in this case. This should be included in the minimum filing requirements. In addition, the Company should file witness testimony supporting the revenue forecast for each rate class. There should also be a complete set of Excel files that reconcile the various supporting workpapers and resulting rate class revenue forecasts to the retail revenues included in the Company's revenue deficiency analysis.[18]

Q. DOES THIS COMPLETE YOUR TESTIMONY?

A. Yes.

[18] In this 2022 case, this analysis is presented in Abramovitz/Adams/Houston/Robinson Schedule 1.